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COSTS AND RETURNS FOR CROP PRODUCTION IN CENTRAL AND NORTHERN ALBERTA

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SUMMARY OF 1983 PRODUCTION COSTS AND RETURNS

FOR CROP PRODUCTION IN ALBERTA

USING THE CASE STUDY APPROACH

BY

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SECTION I

COSTS OF PRODUCING GRAIN AND OILSEEDS IN ALBERTA - 1983

Introduction

The Production and Resource Economics Branch of Alberta Agriculture initiated the case study approach in the fall of 1983 to monitor production costs and returns for the major crops grown in Alberta. As a resource group to Alberta Agriculture staff, primary and prospective producers, and agribusinesses, the branch recognizes the need for a current and comprehensive data base on farm capital investments, material inputs, cultural practices, yields, and costs and returns for all farm enterprises. This project is a major research initiative to establish a production cost and return data base for representative crop enterprises in each of the regions in Alberta.

This report summarizes 1983 costs and returns data that were obtained from a total of sixty-nine (69) grain farms situated in four of the agricultural regions in Alberta - Red Deer, Vermilion, Barrhead, and Peace River.

Objectives

The primary objective of this report is to provide extension personnel and the general public with factual cost of production information for grain and oilseed crops. Other objectives are as follows:

1. To obtain and document current and actual production costs for the main grain and oilseed crops grown in Alberta;
2. To document detailed input/output and costs/returns data by crop enterprise for the six farming regions in Alberta and the total province;
3. To provide each study participant with accurate and detailed costs/returns information on an enterprise and whole farm basis;
4. To provide each study participant with a comparative interpretation of his crop enterprises relative to the total group studied in his region;

5. To regularly monitor and periodically update the above data base;
6. To establish and maintain contact with the farming community and to be able to respond promptly to the needs of producers;
7. To provide headquarter staff, agri-businesses, and the extension field staff with current, accurate, and comprehensive information.

Study Sample and Survey Method

Participants for the 1983 study year were selected by the various District Agriculturists on the basis of several criteria developed by the Regional Economist and the regional farm management planning committees. Factors considered in the selection of farms included farm size, crop rotation, availability of accurate records, level of input use, soil type, etc. Before committing the farms for study, the selected farmers were contacted by the District Agriculturist who briefed them as to the study objectives and the information they would be asked to provide.

The questionnaire which was used to gather the information contained two sections. Section I was a record of all expenses and receipts associated with the farm and was similar to the information required for income tax purposes. Section II was designed to record data specific to each crop enterprise, that is, acres, yield, input costs, returns, etc.

Study participants were contacted after harvest in order to arrange a personal visit for the purpose of completing the two page questionnaire. After analyzing the raw data, the preliminary results and group averages were personally delivered to the participants in order to be reviewed in depth and revised if necessary. Many District Agriculturists participated in the study by accompanying the enumerator during the data collection and data dissemination stages. By March 1984, all of the final individual results and group averages were returned to the participants so that they could be used in the preparation of budgets and plans for the 1984 crop year.

Method of Analysis

All costs and returns data presented in this report are group averages expressed on a per acre basis. The costs shown in the summary pages were calculated for each category of expense by dividing the total of all expenses by the total number of units of production. For example, the fertilizer expense for wheat grown on five farms is calculated by adding the total fertilizer expense for each farm, and then dividing by the total wheat acreage for the five farms. Thus, the costs and returns are weighted on a per unit of production basis rather than calculated using the simple average approach. In some cases, certain cost items were not incurred in an individual operation and as such were taken into account in the method used in determining the average cost.

As observed, costs varied significantly from farm to farm and across the regions and districts. This variability among farms is attributable to such factors as climate, soil type and the management skills of the operators.

Consistent with the principles of economics, the larger scale operators exhibited more efficient operations in comparision to their smaller counterparts. This is largely due to some of the larger scale operators being able to achieve cost efficiencies by purchasing inputs in larger quantities at discount rates and using resources such as machinery and labour more efficiently. On the return side, some operators were able to secure more advantageous marketing arrangements.

In the following paragraphs are the definitions of some of the terms and concepts as used within this report.

Value of Production

Crop Sales: The value of the crop grown during the study year had to be estimated since normally the total harvest is not completely sold until sometime during the next calendar year. However, if the crop had been completely sold at the time of data collection the actual price received was used to determine the total income

from that enterprise. Shown in Table 1 are the price estimates that were used for the 1983 crop.

Insurance Receipts: The 1983 crop was considered to reflect lower to average production in terms of yield per acre. This was observed for many of the northern areas which received excessive amounts of rainfall early in the growing season while others suffered losses due to drought, hail and frost. As such, the significance of crop insurance payouts increased in 1983 as the Alberta Hail and Crop Insurance Corporation paid out to farmers a record amount in lieu of shortfalls in grain and oilseed production.

Variable Cost

Labour Cost: Most study participants relied on hired labour to perform some of the necessary farming operations. The category entitled unpaid family labour in the variable cost section of the summary report includes the cost of the operator, the operator's wife and child labour. The labour rates used to calculate this cost in 1983 were $6.50 per hour for the operator and $4.00 per hour for the other family members.

Material Costs: Most supplies used in grain production were bought during the current production year and recorded as such in the year-end statement. However, it was necessary to record the inventory of many inputs such as seed, fertilizers and chemicals as these inputs might have been purchased the previous year for use in the production year under study. An attempt was made to accurately monitor all costs of inputs used during the twelve month production period, regardless of when purchased or applied to the land. Home-grown seed was valued at market prices and entered as such in the variable cost section of the enterprise analysis.

TABLE 1: LIST OF PRICES USED IN VALUING 1983 CROP

CROP	GRADE	Price	
		$/Bu	$/tonne
Canola	1 Can	8.00	352.74
	2 Can	7.70	339.51
	3 Can	5.75	253.53
Wheat	1 CR	4.70	172.70
	2 CR	4.55	167.19
	3 CR	4.40	161.58
	Feed	3.60	132.28
Barley	1 FD	2.50	114.83
	2 FD	2.40	110.24
	3 FD	2.30	105.64
Oats	1 FD	1.60	103.75
	2 FD	1.45	94.02
Mixed Grain		2.00	110.77
Rye		3.00	118.10
Flax		8.50	334.63
Durum Wheat		4.80	176.38
Winter Wheat		4.50	165.35

Crop/Hail Insurance: It would appear that more grain farmers are now exercising the option of acquiring crop insurance. The incidence of crop/hail insurance policies on grain farms was greater in some regions than others, depending upon the frequency of adverse weather conditions that seriously affect crop production. Crop/Hail insurance premiums were recorded for the total farm and then allocated to the different crops according to coverage.

Machine Operating Costs: Machine operating costs consisted of fuel, oil, lube and repairs. Each study participant provided his total fuel and repair costs for the calendar year under study which was then allocated to each of the crop enterprises studied. On the average, the fuel and repair costs associated with an acre of summerfallow were approximately 45 per cent of that used on a cropped acre.

Miscellaneous Costs: Miscellaneous cost included subscriptions to farm magazines, office supplies, accounting and legal fees, etc. as well as building repairs, utilities, custom work and operating interest paid. Interest paid on operating capital was the actual amount paid by the participant during the year of study and was allocated to only the cropped acres. Utilities included heating fuel, telephone and power, were allocated accordingly to the various grain/oilseed enterprises.

Capital Cost

Cash Rent/Crop Share: Costs associated with the primary or fixed resources used in grain production are indicated in the capital cost section. Land represented the major part of the investment and it's actual cost related to tenure and

equity. Rented land used in crop production was most commonly expressed on a cash rent basis and reflected the actual market value at the time of analysis. For rented land using a crop share arrangement, yield, price per bushel, as well as the cost of inputs were used to arrive at the net land cost.

Taxes and Insurance: Actual costs were recorded for land taxes and building/equipment insurance. These costs are associated with the ownership of capital assets therefore considered capital overhead costs.

Paid Capital Interest: The actual cost associated with owned land depended on the equity levels reported by the various farms. Beginning farmers who recently purchased their farms had high ownership costs in terms of mortgage interest as compared to established farmers. Interest on land as well as the interest paid on buildings and machinery loans were included under the heading of "Paid Capital Interest". Return to equity was also calculated since the participants had provided the market value of all of their investment as well as the amount of liabilities for each category of investment.

Depreciation: Depreciation was determined for all of the buildings and machinery that were used in grain production. In some cases, depreciation was calculated by taking a percentage of the market value that was appropriate to the grain enterprise and dividing by the estimated remaining years of useful life. Building depreciation was allocated only to the crop enterprise (on a per acre basis) while machinery depreciation was allocated to all enterprises including summerfallow. As calculated, the machinery depreciation cost associated with one acre of summerfallow was approximately 45 per cent of a cropped acre.

SECTION II

SUMMARY OF REGIONAL COSTS AND RETURNS FOR THE TOTAL GRAIN FARM

This section provides detailed information on the average regional costs and returns for the grain farms studied in 1983. The number of farms participating in this study ranged from 11 in the Peace River region to 21 in the Red Deer region. Average acreage per farm under cultivation ranged from 998.10 in the Barrhead region to 1,362.47 in the Vermilion region. Table 2 provides a cost and return summary of the average grain farm studied in each region.

Value of Production

The value of production expressed on a per acre basis was derived from two sources, namely, from the value of the crop itself and secondly, from crop and hail insurance received. As was mentioned earlier, 1983 represented a year of lower to average yields in which the crop insurance income on some farms was significantly higher in comparison to income received from crop sales. Weighted average values of production on a per cultivated acre basis ranged from $106.06 in the Peace River region to $137.32 per acre in the Vermilion region. As to the importance of crop insurance income, these ranged from $2.15 per acre in the Vermilion Region to $4.37 in the Red Deer Region.

Variable Cost

The variable cost includes all money costs that must be incurred if an enterprise is to function. Variable costs represented approximately 60 per cent of the total production costs incurred in 1983. Of major importance are the costs for material inputs, labour and machine operation. Table 2A presents a detailed breakdown of the cost items comprising the total variable cost.

Seed, fertilizer, and chemical costs were all significantly lower in the Peace River region and accounted for the lower variable cost reported for this

TABLE 2: REGIONAL COMPARISON OF COSTS AND RETURNS ON GRAIN FARMS - 1983

REGION	RED DEER		VERMILION		BARRHEAD		PEACE RIVER	
Number of Farms	21		17		20		11	
Average Farm Size (Acres)	1286.24		1362.47		998.10		1046.18	
	- - - - - - - - - - Dollars Per Acre - - - - - - - - - -							
Crop Sales	131.80		135.17		119.70		103.72	
Insurance Receipts	4.37		2.15		2.56		2.34	
VALUE OF PRODUCTION	136.17		137.32		122.26		106.06	
VARIABLE COST								
Materials	31.24		30.28		32.26		21.96	
Hail/Crop Insurance	4.37		2.15		2.56		2.34	
Fuel and Repairs	12.91		14.60		16.32		15.33	
Paid Labour	4.60		2.64		1.85		2.69	
Operator Labour	10.73		15.24		11.87		9.56	
Miscellaneous	8.73		6.02		4.83		6.12	
TOTAL VARIABLE COST	72.58		70.93		69.69		58.00	
CAPITAL COST								
Cash Rent/Crop Share	13.29		11.13		13.29		4.18	
Taxes and Insurance	3.03		3.63		2.72		2.90	
Equip.,Bldg. Depreciation	22.27		23.25		26.00		19.62	
Paid Capital Interest	9.51		9.67		8.66		12.01	
TOTAL CAPITAL COST	48.10		47.68		50.68		38.70	
TOTAL COST	120.67		118.61		120.37		96.70	
Return to Capital (Cont. Margin)	63.59		66.38		52.57		48.06	
Return to Equity	15.50	2.57%	18.71	3.02%	1.89	0.33%	9.36	2.27%
Equity	86%		87%		87%		80%	
Debt Capacity ($/Ac)	412.49		427.43		339.51		307.60	
Production Value of Land ($/Ac)	308.09		327.87		173.50		167.32	
Market Value of Land ($/Ac)	686.96		663.54		701.71		363.80	
Machinery Investment ($/Ac)	192.90		207.65		226.87		174.59	

TABLE 2A: BREAKDOWN OF VARIABLE COSTS ON GRAIN FARMS BY REGION - 1983

REGION	RED DEER	VERMILION	BARRHEAD	PEACE RIVER
Crop Sales	132.82	129.00	112.98	97.97
Insurance Receipts	3.35	8.32	9.28	8.09
	- - - - - - - - - - Dollars Per Acre - - - - - - - - -			
VALUE OF PRODUCTION	136.17	137.32	122.26	106.06
VARIABLE COSTS				
Seed	5.21	5.75	5.73	4.66
Fertilizer	17.18	15.78	18.82	12.62
Chemicals	8.85	8.75	7.71	4.68
Hail/Crop Insurance	4.37	2.15	2.56	2.34
Fuel	7.38	8.24	9.99	9.28
Repairs - Machine	5.53	6.36	6.33	6.05
Repairs - Buildings	0.81	1.05	0.21	1.45
Utilities	1.11	1.65	1.28	1.50
Custom Work	1.05	0.69	0.76	0.17
Miscellaneous	2.66	1.32	1.04	2.04
Operating Interest Paid	3.09	1.31	1.55	0.96
Paid Labour	4.60	2.64	1.85	2.69
Family and Operator Labour	10.73	15.24	11.87	9.56
TOTAL VARIABLE COST	72.58	70.93	69.69	58.00
Return to Capital or Contribution Margin	63.59	66.38	52.57	48.06

region. The Red Deer region reported relatively higher costs for actual operating interest paid, custom work, and crop/hail insurance premiums.

Value of production less the total variable cost equals return to capital or contribution margin. The return to capital is the residual to cover the capital cost associated with land, machinery and building investment. Contribution margins are often used by producers to compare the profitability of various crops. As Table 2 shows, return to capital ranged from $48.06 per acre in the Peace River region to $66.38 per acre in the Vermilion region.

Capital Cost

Costs associated with the primary or fixed resources used in grain production are indicated in the capital cost section of Table 2. The actual cost of land will depend on the tenure and equity position established by the operator. For example, some operations on the study indicated a 100 per cent equity and no rented land, thereby resulting in no actual cost incurred for land. On the other extreme were those operations with high interest payments associated with land that was purchased on terms. The cash rent/crop share values reported reflect market prices and are spread out over all acres farmed. These values ranged from $4.18 per acre in the Peace River region to $13.29 per acre in the Red Deer and Barrhead regions, respectively. Taxes and insurance which are associated with the ownership of fixed resources are reported separately, ranging from $2.72 per acre in the Barrhead region to $3.63 per acre in the Vermilion region. Building and equipment depreciation based on market value ranged from $19.62 per acre in the Peace River region to $26.00 per acre in the Barrhead region. The lower depreciation cost in the Peace River Region is as a result of their lower investment which in 1983 was $174.59 per acre compared to that of $226.87 per acre in the Barrhead region. Building investment per acre ranged from $43.15 per acre in the Peace River region to $66.32 per acre in the Barrhead region (see Table 2B).

Interest payments associated with the ownership of the capital resources namely land, machinery and buildings are shown as a separate entry entitled paid capital interest. As a matter of interest, the weighted average interest rate for capital loans ranged from 9.9 per cent in the Red Deer region to 11.56 per cent in the Peace River region. The total interest paid on capital loans

TABLE 2B: SUMMARY OF INVESTMENT BY REGION - 1983

REGION	RED DEER	VERMILION	BARRHEAD	PEACE RIVER
	- - - - - - - - - - Dollars Per Acre - - - - - - - - - -			
Buildings	59.56	49.62	66.32	43.15
Machinery	192.90	207.65	226.87	174.59
Land	686.96	663.54	701.71	363.80
TOTAL	939.42	920.81	994.90	581.54

ranged from $8.66 per acre in the Barrhead region to $12.01 per acre in the Peace River region. To summarize, total capital costs which include cash rent-/crop share, taxes and insurance, equipment and building depreciation, and paid capital interest ranged from $38.70 per acre in the Peace River region to $50.68 per acre in the Barrhead region.

Total Production Cost

Total production cost was obtained by summing the total variable cost and the total capital cost. From Table 2, total production cost was the highest in the Red Deer region at $120.67 per acre followed by the Barrhead region at $120.37 per acre, then by the Vermilion region at $118.61 per acre and finally by the Peace River region at $96.70.

Costs were the lowest in the Peace River region for a number of reasons. First of all, this region reported the lowest input usage as reflected in the lower material input cost of $21.96 per acre, a difference of $9.30 less than the average of $31.26 per acre reported for the other three regions. Secondly, most of the land farmed in this region was owned as reflected by the low value of $4.18 per acre for cash rent/crop share versus that of $13.29 per acre and $11.13 for the other three respective regions. In terms of investment, these were also found to be low as the Peace River region had an investment of $581.54 per acre as opposed to the average of $951.71 per acre reported for the other three regions (see Table 2B). Consequently, the cost on buildings, equipment and depreciation was relatively low at $19.62 per acre versus that of $26.00 per acre, $23.25 per acre and $22.27 per acre for the Barrhead, Vermilion and Red Deer regions, respectively. Similarly, higher crop share-

/cash rent, investment and material input costs were all contributory factors in the higher production costs reported for the Barrhead and Red Deer regions.

Evaluating the Performance of Grain Farms

The performance of any grain farm must be constantly monitored if the best returns are to be achieved from the resources employed. To do this, a number of parameters have been established which, if adhered to, results in a successful enterprise.

Perhaps one of the best indicators used in evaluating performance is that of the return to capital otherwise known as the contribution margin. Simply defined, the contribution margin is that amount which is left over after the total variable cost has been deducted from the value of production. Should this value ever become negative this implies that the enterprise is failing. That is, the value of production generated is insufficient to cover the total variable cost, thus resulting in a loss. From Table 2, it is quite evident that all of the regions were covering their total variable cost. Of the four regions studied, the highest contribution margin on a per acre basis was attained by the Vermilion region which reported $66.38, followed by Red Deer at $63.59, Barrhead at $52.57 and finally by Peace River at $48.06.

Another indicator used to measure performance is that of the return to equity or profit. Return to equity may be defined as that residual which is left over for future investment after all production costs have been deducted. That is, both the variable costs and capital costs are deducted from the value of production. For the study, capital cost included items such as cash rent-/crop share, taxes and insurance, equipment and building costs, depreciation and paid capital interest. Referring back to Table 2, shows that all of the regions experienced a positive return to equity with the most profitable grain farms being located in the Vermilion region. The return to equity for the farms in the Vermilion region was $18.71 per acre while the Barrhead region indicated the lowest amount of $1.89 per acre. The Red Deer and Peace River region showed returns on equity of $15.50 and $9.36 per acre, respectively.

Also shown in Table 2 is the debt capacity. Debt capacity is the ability to assume new debt. It is calculated by summing the return to equity, the paid capital interest, depreciation, and cash rent/crop share, the total of which is

amortized over a period of 15 years at 12 per cent. It should be noted that in the calculation of debt capacity, no consideration was given to income tax. Debt capacity ranged from $307.60 per acre in the Peace River region to $427.43 per acre in the Vermilion region, implying that farms in the latter region were in a much better financial position to accommodate a larger debt load when compared to the remaining three regions.

Given as well in Table 2 is the productive value of land. The productive value of land is different from its market value in that it is a derived value based upon the performance of agricultural land with respect to net returns from grain production. Essentially, it is calculated by summing the return to equity, paid capital interest and cash rent/crop share, the total of which is amortized over a 25 year period at 10 per cent. It is not uncommon to find the market value of land to be higher than its productive value. The reason for this is that the market value of land is merely reflective of what prevailing land costs are for similar land in a specific area and to a large extent makes no compromises for its actual productivity. For example, the Barrhead region reported the highest land cost of $701.71 per acre while its actual productivity value was $173.50 per acre. On the other hand, this difference was quite small for the Peace River region which reported an average market value of $363.80 per acre and a land productive value of $167.32 per acre. For the Vermilion region, the productive value of land was $327.87 per acre while the market value was $663.54 per acre. In the Red Deer region this difference was somewhat larger as the market value was $686.96 compared to its productive value of $308.09.

Average machinery investment among the four regions varied by approximately 23 per cent. The region having the least machinery investment was Peace River which reported an average value of $174.59 per acre while the Barrhead region reported an average of $226.87 per acre. For the Vermilion and Red Deer regions the average machinery investment was $207.65 and $192.90 per acre, respectively.

SECTION III

SUMMARY OF COSTS AND RETURNS FOR ALL CROPS SRUVEYED

This section provides detailed information on the average regional costs and returns for the various crops analyzed. Unlike previous studies where barley was the dominant crop, wheat was the most extensively grown crop in 1983 in the four regions studied. This was followed by barley, then canola and finally oats. The table below indicates the average acreage per participating farm for the main crops and summerfallow in each region.

TABLE 3: CROPPING PATTERN BY REGION - 1983

	RED DEER	VERMILION	BARRHEAD	PEACE RIVER	NUMBER OF ENTERPRISES
	- - - - - - - - - - - - Acres Per Farm - - - - - - - - -				
Wheat	331.05	252.65	192.11	214.4	104
Barley	164.33	182.95	284.81	192.00	78
Canola	212.86	216.71	154.12	182.44	85
Oats	80.00	83.00	38.00	-	15
Summerfallow	254.00	212.25	167.27	239.12	47
TOTAL	1042.24	947.56	836.31	827.96	329

Wheat Production

Average wheat yields in 1983 (Table 4) ranged from a low of 29.90 bushels in the Peace River region to 38.83 bushels in the Barrhead region. Crop insurance receipts were significant especially in the Peace River region at $17.49 per acre. Upon observation it was found that six of the twelve enterprises in this group reported crop insurance receipts. On a per bushel basis, the actual price of wheat ranged from $4.38 in the Barrhead region to $4.98 in the Peace River region. It should be remembered that these prices took into account the crop insurance income and quality of wheat. Value of production for the Red Deer, Vermilion, and Barrhead regions were $155.88, $166.90, and $169.96 per acre, respectively.

There was less variation in per acre variable cost among the four regions. The Barrhead region incurred the highest material and fuel/repair cost but

overall had the lowest variable cost at $76.34 per acre or $1.97 per bushel. The highest variable cost was reported in the Red Deer region at $78.70 per acre or $2.33 per bushel.

Capital cost for wheat production ranged from $43.17 per acre in the Peace River region to $53.25 in the Barrhead region. The item contributing to this difference was the value of cash rent/crop share at $16.69 per acre in the Barrhead region versus $2.94 in the Peace River region. Depreciation, taxes and insurance costs were comparable among the regions averaging $23.94 and $3.12, respectively. Paid capital interest costs were approximately 39 per cent higher in the Peace River region averaging $14.02 per acre as compared to the average of $10.06 per acre for the the Red Deer, Vermilion and Barrhead regions. As the cash rent/crop share figure would indicate, most of the Peace River farmers had owned land and as such had the lowest cost of $2.94 per acre while the Barrhead region had a cost of $16.69 per acre indicating a greater degree of rented land in these operations.

Total production cost for wheat production ranged from a low of $120.28 per acre ($4.02 per bushel) in the Peace River region to a high of $129.59 per acre ($3.34 per bushel) in the Barrhead region. Return to capital (contribution margin) ranged from $71.92 per acre in the Peace River region to $93.62 per acre in the Barrhead region. While the return to equity ranged from $27.13 per acre (4.55 per cent) in the Red Deer region to $40.36 per acre (7.76 per cent) in the Barrhead region. Refer to Table 4 for more detail on debt capacity, market and productive values for land and machinery investment.

Barley Production

Referring to Table 5, barley yields in 1983 ranged from 45.14 bushels in the Vermilion region to 62.74 bushels in the Red Deer region. The value of production ranged from $118.69 per acre in the Barrhead region to $164.25 per acre in the Red Deer region. In contrast to wheat production, a wide range of variable costs existed for barley production, from $62.80 per acre in the Peace River region to $95.41 per acre in the Red Deer region. It is interesting to note that the Red Deer region, despite its high yield, had relatively high variable costs on a per bushel basis at $1.52 in comparison to $1.26 per bushel for the Peace River region.

Capital costs for barley production ranged from $43.72 per acre in the Peace River region to $54.39 per acre in the Red Deer region. The Peace River region reported the highest interest paid on a per acre basis and the lowest cash rent/crop share. Total production cost in the the Peace River region totalled $106.52 per acre or $2.14 per bushel. For the Red Deer region this cost was $149.80 per acre or 2.39 per bushel. The highest return to equity of $18.99 per acre (5.08 per cent) was observed in the Peace River region and is largely due to a lower cost structure and a higher yield. The Red Deer region was second with a return to equity of $14.45 per acre (1.61 per cent). The Vermilion and Barrhead regions had no return to equity as their production costs exceeded their total returns by $4.52 and $6.31 per acre, respectively. The range in equity levels on farms with barley production ranged from 73 per cent in the Peace River region to 93 per cent in the Vermilion region.

Canola Production

Of all the crops grown in 1983, canola production had the highest range in per acre yields. On a regional level, canola yields ranged from 12.98 bushels in the Barrhead region to 22.90 bushels in the Red Deer region, (Table 6), and average returns per acre varied from $119.46 per acre in the Peace River region to $192.82 per acre in the Red Deer region.

Variable costs ranged from a low of $69.69 per acre in the Peace River region to $88.27 per acre in the Red Deer region. As can be seen the need for high production relative to cost is very significant. For example, in the Barrhead region the cost was $6.25 to produce a bushel of canola versus that of $3.85 per bushel in the Red Deer region - the principal difference for this was due to yield as Red Deer reported a yield of 22.90 bushels per acre compared to 12.98 bushels per acre in the Barrhead region.

Capital costs for canola production ranged from $51.99 in the Vermilion region to $59.53 in the Red Deer region. Again, the Peace River region reported high capital interest costs at $15.74 per acre while the Red Deer region reported a relatively high cash rent/crop share cost of $22.81 per acre. As anticipated, the Red Deer region with the highest yield had the highest per acre total production cost of $147.80 but the lowest per bushel cost of $6.45.

For the Barrhead region, its capital costs were $135.29 per acre or $10.43 per bushel.

The Red Deer and Vermilion regions were exclusive in showing a positive return to equity in the order of $45.02 (7.18 per cent) and $31.21 (4.99 per cent) per acre, respectively. As a note of interest, the productive value of land in the Red Deer region based on a 22.90 bushel canola yield was calculated to be $647.69 per acre and compares to the market value of $786.22 per acre. Machinery investment was quite similar for all of the regions and ranged from $217.30 in Vermilion to $239.41 in Barrhead.

Oats Production

Oats production is not considered a major crop on grain farms since it is more often grown on farms having a livestock enterprise where the grain is used in the feeding program. Only 17 farms or 24.6 per cent of all farms on study grew oats in 1983. As indicated in Table 7, group average data is only available for the Red Deer, Vermilion, and Barrhead regions for which a total of 15 records were analyzed. The average acreage of oats on the 15 farms was 67 which is considerably less than the acreages for wheat, barley, and canola. Yields in 1983 ranged from 44.0 bushels in the Vermilion region to 104.47 bushels in the Barrhead region. Value of production ranged from $82.93 per acre in the Vermilion region to $193.25 per acre in the Barrhead region.

Variable costs ranged from $48.49 in the Red Deer region to $69.07 in the Barrhead region in which high material costs coincided with high yields. Capital costs for oats production ranged from $43.93 in the Red Deer region to $56.63 in the Barrhead region. Although this analysis is limited to a small number of farms, it demonstrates that oats production can yield a high return to equity and compete with crops like wheat and canola. Returns to equity for the Red Deer and Barrhead regions were $1.96 per acre and $67.54 per acre, respectively. However, the Vermilion region failed to generate adequate returns to cover its cost therefore reported a negative value of $19.21 per acre.

Summerfallow Costs

In the 1983 crop year, 47 farms (68 per cent) incorporated the practice of summerfallow into their farming operation. The average acreage summerfallowed on these farms was well over 200 acres. Variable costs incurred in summerfallow operations are primarily associated with machine operation and include fuel, repairs, and labour. As presented in Table 8, the range in variable costs for summerfallow operations in 1983 was $12.12 per acre in the Vermilion region to $16.58 per acre in the Barrhead region. A short term breakeven yield required to cover summerfallow costs can be calculated by dividing the variable cost by the price per bushel for the crop considered.

Capital cost associated with summerfallow ranged from $13.91 per acre in the Peace River region to $20.65 per acre in the Vermilion region. A cash rent/crop share expense was reported for the Red Deer and Vermilion regions suggesting that some cash rent agreements do not provide consideration for the summerfallow year. A typical cash rent agreement would stipulate that land rental shall not be charged for the summerfallow year. Machinery depreciation, on average, represented 46 per cent of the capital cost while paid capital interest accounted for 36 per cent. Total summerfallow cost ranged from $29.65 per acre in the Peace River region to $37.19 in the Barrhead region.

TABLE 4: REGIONAL COMPARISON OF COSTS AND RETURNS FOR WHEAT PRODUCTION - 1983

REGION	RED DEER		VERMILION		BARRHEAD		PEACE RIVER	
Number of Enterprise	38		36		18		12	
Average Acreage	331.05		252.65		192.11		214.40	
Average Yield (Bu/Acre)	33.79		36.28		38.83		29.90	
	- - - - - - - - - - - Dollars Per Acre - - - - - - - - - - -							
Crop Sales	152.82		162.76		163.18		131.55	
Insurance Receipts	3.06		4.14		6.78		17.49	
VALUE OF PRODUCTION	155.88	4.61/Bu	166.90	4.60/Bu	169.96	4.38/Bu	149.03	4.98/Bu
VARIABLE COST								
Materials	35.23		34.56		38.40		32.26	
Hail/Crop Insurance	4.09		2.36		2.02		2.55	
Fuel and Repairs	13.50		15.39		17.41		19.33	
Paid Labour	5.02		2.65		1.67		3.35	
Operator Labour	10.81		16.16		12.87		11.55	
Miscellaneous	10.05		6.21		3.97		8.07	
TOTAL VARIABLE COST	78.70	2.33/Bu	77.33	2.13/Bu	76.34	1.97/Bu	77.11	2.58/Bu
CAPITAL COST								
Cash Rent/Crop Share	13.09		11.45		16.69		2.94	
Taxes and Insurance	3.13		3.52		2.05		3.16	
Equip.,Bldg. Depreciation	23.45		24.21		25.02		23.06	
Paid Capital Interest	10.38		10.32		9.49		14.02	
TOTAL CAPITAL COST	50.05		49.51		53.25		43.17	
TOTAL COST	128.75	3.81/Bu	126.83	3.50/Bu	129.59	3.34/Bu	120.28	4.02/Bu
Return to Capital (Cont. Margin)	77.19		89.57		93.62		71.92	
Return to Equity	27.13	4.55%	40.06	6.53%	40.36	7.76%	28.75	6.27%
Equity	85%		86%		85%		80%	
Debt Capacity ($/Ac)	504.37		586.12		623.63		468.34	
Production Value of Land ($/Ac)	414.30		526.99		565.66		343.81	
Market Value of Land ($/Ac)	659.78		673.53		756.96		377.99	
Machinery Investment ($/Ac)	201.07		215.89		220.64		198.94	

TABLE 5: REGIONAL COMPARISON OF COSTS AND RETURNS FOR BARLEY PRODUCTION -- 1983

REGION	RED DEER		VERMILION		BARRHEAD		PEACE RIVER	
Number of Enterprise	16		23		31		8	
Average Acreage	164.33		182.95		284.81		192.00	
Average Yield (Bu/Acre)	62.74		45.14		46.27		49.67	
	- - - - - - - - - - Dollars Per Acre - - - - - - - - - -							
Crop Sales	162.89		112.44		109.20		124.17	
Insurance Receipts	1.36		15.50		9.50		1.34	
VALUE OF PRODUCTION	164.25	2.62/Bu	127.94	2.83/Bu	118.69	2.57/Bu	125.50	2.53/Bu
VARIABLE COST								
Materials	38.91		32.97		37.41		25.49	
Hail/Crop Insurance	8.07		2.13		2.04		2.60	
Fuel and Repairs	17.45		15.26		18.12		14.94	
Paid Labour	5.08		3.49		2.23		2.95	
Operator Labour	16.51		18.45		11.91		10.25	
Miscellaneous	9.39		7.32		3.10		6.57	
TOTAL VARIABLE COST	95.41	1.52/Bu	79.62	1.76/Bu	74.81	1.62/Bu	62.80	1.26/Bu
CAPITAL COST								
Cash Rent/Crop Share	10.76		15.29		12.42		4.83	
Taxes and Insurance	4.30		4.19		2.84		3.18	
Equip.,Bldg. Depreciation	30.54		27.53		27.03		20.45	
Paid Capital Interest	8.79		5.83		7.90		15.25	
TOTAL CAPITAL COST	54.39	0.87/Bu	52.84	1.17/Bu	50.20	1.08/Bu	43.72	0.88/Bu
TOTAL COST	149.80	2.39/Bu	132.46	2.93/Bu	125.01	2.70/Bu	106.52	2.14/Bu
Return to Capital (Cont. Margin)	68.84		48.32		43.88		62.71	
Return to Equity	14.45	1.61%	-4.52		-6.31		18.99	5.08%
Equity	91%		93%		89%		73%	
Debt Capacity ($/Ac)	439.58		300.60		279.52		405.40	
Productive Value of Land ($/Ac)	265.31		124.49		95.73		284.88	
Market Value of Land ($/Ac)	839.94		690.96		704.44		370.68	
Machinery Investment ($/Ac)	259.36		243.02		234.14		185.69	

TABLE 6: REGIONAL COMPARISON OF COSTS AND RETURNS FOR CANOLA PRODUCTION - 1983

REGION	RED DEER		VERMILION		BARRHEAD		PEACE RIVER	
Number of Enterprise	26		27		17		15	
Average Acreage	212.86		216.71		154.12		182.44	
Average Yield (Bu/Acre)	22.90		18.69		12.98		13.62	
	- - - - - - - - - - - Dollars Per Acre - - - - - - - - - - -							
Crop Sales	185.30		147.51		105.78		108.99	
Insurance Receipts	7.52		14.94		29.23		10.47	
VALUE OF PRODUCTION	192.82	8.42/Bu	162.44	8.69/Bu	135.01	10.40/Bu	119.46	8.77/Bu
VARIABLE COST								
Materials	41.96		35.83		36.02		25.97	
Hail/Crop Insurance	6.36		2.83		4.73		3.93	
Fuel and Repairs	13.74		15.45		17.32		16.99	
Paid Labour	5.29		2.84		2.73		4.16	
Operator Labour	11.16		15.65		12.70		10.37	
Miscellaneous	9.76		6.64		7.66		8.27	
TOTAL VARIABLE COST	88.27	3.85/Bu	79.24	4.24/Bu	81.16	6.25/Bu	69.69	5.12/Bu
CAPITAL COST								
Cash Rent/Crop Share	22.81		12.81		18.73		7.69	
Taxes and Insurance	2.84		3.91		2.90		2.95	
Equip.,Bldg. Depreciation	25.33		24.53		27.69		26.66	
Paid Capital Interest	8.56		10.74		4.92		15.74	
TOTAL CAPITAL COST	59.53	2.60/Bu	51.99	2.78/Bu	54.23	4.18/Bu	53.05	3.90/Bu
TOTAL COST	147.80	6.45/Bu	131.23	7.02/Bu	135.29	10.43/Bu	122.75	9.02/Bu
Return to Capital (Cont. Margin)	104.55		83.20		53.85		49.76	
Return to Equity	45.02	7.18%	31.21	4.99%	-0.29		-3.29	
Equity	88%		87%		94%		75%	
Debt Capacity ($/Ac)	692.73		540.04		347.00		318.81	
Productive Value of Land ($/Ac)	647.69		461.09		169.92		77.79	
Market Value of Land ($/Ac)	786.22		654.55		792.06		361.94	
Machinery Investment ($/Ac)	220.50		217.30		239.41		236.91	

TABLE 7: REGIONAL COMPARISON OF COSTS AND RETURNS FOR OATS PRODUCTION - 1983

REGION	RED DEER		VERMILION		BARRHEAD	
Number of Enterprise	5		5		5	
Average Enterprise Size (Acres)	80		83		38	
Average Yield (Bu/Acre)	48.97		44.00		104.47	
	- - - - - - - Dollars Per Acre - - - - - - -					
Crop Sales	89.25		82.93		193.25	
Insurance Receipts	5.13		0		0	
VALUE OF PRODUCTION	94.38	1.93/Bu	82.93	1.88/Bu	193.25	1.85/Bu
VARIABLE COST						
Materials	12.84		17.66		29.74	
Hail/Crop Insurance	2.68		0.11		3.71	
Fuel and Repairs	14.25		13.68		17.69	
Paid Labour	1.96		3.18		0.80	
Operator Labour	14.09		14.86		13.14	
Miscellaneous	2.67		5.15		3.99	
TOTAL VARIABLE COST	48.49	0.99/Bu	54.64	1.24/Bu	69.07	0.66/Bu
CAPITAL COST						
Cash Rent/Crop Share	8.71		15.18		11.08	
Taxes and Insurance	3.40		3.47		3.19	
Equip.,Bldg. Depreciation	22.29		20.66		38.04	
Paid Capital Interest	9.53		8.19		4.32	
TOTAL CAPITAL COST	43.93	0.90/Bu	47.50	1.08/Bu	56.63	0.54/Bu
TOTAL COST	92.42	1.89/Bu	102.14	2.32/Bu	125.71	1.20/Bu
Return to Capital (Cont. Margin)	45.88		28.29		124.18	
Return to Equity	1.96	0.37%	-19.21	-4.11%	67.54	7.61%
Equity	85%		86%		95%	
Debt Capacity ($/Ac)	289.39		169.06		824.01	
Productive Value of Land ($/Ac)	174.18		-2.42		734.26	
Market Value of Land ($/Ac)	469.37		663.95		802.63	
Machinery Investment ($/Ac)	182.43		190.53		319.62	

TABLE 8: REGIONAL COMPARISON OF SUMMERFALLOW COSTS - 1983

REGION	RED DEER	VERMILION	BARRHEAD	PEACE RIVER
Number of Enterprise	15	13	11	8
Average Enterprise Size (Acres)	254	212.25	167.27	239.12
	- - - - - - - - - - Dollars Per Acre - - - - - - - - - -			
VARIABLE COST				
Materials				
Hail/Crop Insurance				
Fuel and Repairs	5.35	5.66	8.17	8.65
Paid Labour	1.24	0.60	1.05	0.60
Operator Labour	5.03	5.01	6.11	5.15
Miscellaneous	2.35	0.85	1.25	1.34
TOTAL VARIABLE COST	13.97	12.12	16.58	15.74
CAPITAL COST				
Cash Rent/Crop Share	2.83	1.70	-	-
Taxes and Insurance	1.90	1.94	2.68	1.59
Equip.,Bldg. Depreciation	7.53	8.54	10.72	8.07
Paid Capital Interest	7.15	8.47	7.22	4.24
TOTAL CAPITAL COST	19.41	20.65	20.62	13.91
TOTAL COST	33.38	32.76	37.19	29.65
Return to Capital (Cont. Margin)	-13.97	-12.12	-16.58	-15.74
Return to Equity	-33.38	-32.76	-37.19	-29.65
Equity	83%	84%	90%	92%
Debt Capacity ($/Ac)				
Productive Value of Land ($/Ac)				
Market Value of Land ($/Ac)	549.57	622.43	904.62	348.22
Machinery Investment ($/Ac)	75.33	85.40	107.18	80.69

SECTION IV

A COMPARISON OF CROP ALTERNATIVES BY REGION

Although most grain farms follow a rotation in their cropping program, there still remains some flexibility in deciding what crops should be grown and their respective acreage. This section is designed to present a comparison of the main crops analyzed in each of the regions surveyed in 1983. For the purpose of this analysis no reference will be made to oats production as only a few enterprises were analyzed and the average acreage per farm was less than significant relative to wheat, barley, and canola production.

Red Deer Region

Table 9 presents cost and return data for the main crops surveyed in the Red Deer region. Wheat production was very significant in the Red Deer region as 38 enterprises averaging 331.05 acres were analyzed for the 21 farms on the study.

The Red Deer region had the highest yield in 1983 relative to the other regions surveyed for both canola and barley production at 22.9 bushels per acre and 62.74 bushels per acre, respectively. Value of production per acre was $155.88 for wheat, $164.25 for barley, and $192.82 for canola.

With reference to the three main crops, variable cost per acre as well as capital costs per acre were the lowest for wheat production. Material costs, crop insurance, and machine costs were relatively high for the canola and barley crops. The barley enterprise also had the highest cost for depreciation on equipment as well as the highest fuel and repair cost, resulting in a high machinery input for this crop.

Total production costs per acre varied from $128.75 for wheat to $149.80 for barley. In relation to these costs, the value of production had a range from $155.88 for wheat to $192.82 for canola. Unlike the other regions on study, all crops surveyed in the Red Deer region had positive return to equity with the range being $14.45 for barley to $45.02 per acre for canola. Express-

TABLE 9: COMPARISON OF CROP ALTERNATIVES - RED DEER REGION

CROP	WHEAT		CANOLA		BARLEY		OATS	
Number of Enterprise	38		26		16		5	
Average Acreage	331.05		212.86		164.33		80	
Average Yield (Bu/Acres)	33.79		22.9		62.74		48.97	
	- - - - - - - - - - Dollars Per Acre - - - - - - - - - -							
Crop Sales	152.82		185.30		162.89		89.25	
Insurance Receipts	3.06		7.52		1.36		5.13	
VALUE OF PRODUCTION	155.88	4.61/Bu	192.82	8.42/Bu	164.25	2.62/Bu	94.38	1.93/Bu
VARIABLE COST								
Materials	35.23		41.96		38.91		12.84	
Hail/Crop Insurance	4.09		6.36		8.07		2.68	
Fuel and Repairs	13.50		13.74		17.45		14.25	
Paid Labour	5.02		5.29		5.08		1.96	
Operator Labour	10.81		11.16		16.51		14.09	
Miscellaneous	10.05		9.76		9.39		2.67	
TOTAL VARIABLE COST	78.70	2.33/Bu	88.27	3.85/Bu	95.41	1.52/Bu	48.49	0.99/Bu
CAPITAL COST								
Cash Rent/Crop Share	13.09		22.81		10.76		8.71	
Taxes and Insurance	3.13		2.84		4.30		3.40	
Equip.,Bldg. Depreciation	23.45		25.33		30.54		22.29	
Paid Capital Interest	10.38		8.56		8.79		9.53	
TOTAL CAPITAL COST	50.05	1.48/Bu	59.53	2.60/Bu	54.39	.87/Bu	43.93	0.90/Bu
TOTAL COST	128.75	3.81/Bu	147.80	6.45/Bu	149.80	2.39/Bu	92.42	1.89/Bu
Return to Capital (Cont. Margin)	77.19		104.55		68.84		45.88	
Return to Equity	27.13	4.55%	45.02	7.18%	14.45	1.61%	1.96	0.37%
Equity	85%		88%		91%		85%	
Debt Capacity ($/Ac)	504.37		692.73		439.58		289.39	
Productive Value of Land ($/Ac)	414.30		647.69		265.31		174.18	
Market Value of Land ($/Ac)	659.78		786.22		839.94		469.37	
Machinery Investment ($/Ac)	201.07		220.50		259.36		182.43	

ed as a percentage, return to equity ranged from 1.61 for barley to 7.18 for canola.

The debt carrying capacity based on a 12 per cent interest rate and a 15 year amortization period ranged from $439.58 per acre for barley to $692.73 per acre for canola. Similarly, calculated land productive values, based on an interest rate of 10 per cent and a 25 year amortization period varied from $265.31 per acre for barley to $647.69 per acre for canola. Machinery investment among the three crops varied little and ranged from $201.07 per acre for wheat production to $259.36 per acre for barley production.

Vermilion Region

Presented in Table 10 are costs and returns data for the main crops analyzed in the Vermilion region. Similar to the Red Deer region, wheat production was the most important as consisting of a total of 17 farms, 36 enterprises averaging 252.65 acres were analyzed.

Yields in the Vermilion region in 1983 were 18.69 bushels for canola, 36.28 bushels for wheat and 45.14 bushels for barley and the value of production was quite variable ranging from a low of $127.94 per acre for barley to $166.90 per acre for wheat.

The per acre variable cost was found to be quite similar for the three main crops analyzed and was $77.33 for wheat, $79.24 for canola and $79.62 for barley. As to the significance of the various variable cost items, material input, labour, and fuel and repairs accounted for 44 per cent, 25 per cent and 20 per cent, respectively of the total variable cost. Capital costs were also quite similar ranging from $49.51 per acre for wheat to $52.84 per acre for barley.

The total cost structure for grain production in the Vermilion region was observed to be quite similar regardless of the type of crop grown. For example, total cost was $126.83 per acre for wheat, $131.23 per acre for canola and $132.46 per acre for barley. For such similar cost structures it can be said that the return to equity is influenced to a greater degree not by the cost structure but rather by the value of production. Therefore for any crop showing a high return it would be expected that a high yield and price to be associated with it as well.

TABLE 10: COMPARISON OF CROP ALTERNATIVES - VERMILION REGION

CROP	WHEAT		CANOLA		BARLEY		OATS	
Number of Enterprise	36		27		23		5	
Average Acreage	252.65		216.71		182.95		83	
Average Yield (Bu/Acres)	36.28		18.69		45.14		44.0	
	- - - - - - - - - - - - Dollars Per Acre - - - - - - - - - - - -							
Crop Sales	162.76		147.51		112.44		82.93	
Insurance Receipts	4.14		14.94		15.50		0	
VALUE OF PRODUCTION	166.90	4.60/Bu	162.44	8.69/Bu	127.94	2.83/Bu	82.93	1.88/Bu
VARIABLE COST								
Materials	34.56		35.83		32.97		17.66	
Hail/Crop Insurance	2.36		2.83		2.13		.11	
Fuel and Repairs	15.39		15.45		15.26		13.68	
Paid Labour	2.65		2.84		3.49		3.18	
Operator Labour	16.16		15.65		18.45		14.86	
Miscellaneous	6.21		6.64		7.32		5.15	
TOTAL VARIABLE COST	77.33	2.13/Bu	79.24	4.24/Bu	79.62	1.76/Bu	54.64	1.24/Bu
CAPITAL COST								
Cash Rent/Crop Share	11.45		12.81		15.29		15.18	
Taxes and Insurance	3.52		3.91		4.19		3.47	
Equip.,Bldg. Depreciation	24.21		24.53		27.53		20.66	
Paid Capital Interest	10.32		10.74		5.83		8.19	
TOTAL CAPITAL COST	49.51		51.99	2.78/Bu	52.84	1.17/Bu	47.50	1.08/Bu
TOTAL COST	126.83	3.50/Bu	131.23	7.02/Bu	132.46	2.93/Bu	102.14	2.32/Bu
Return to Capital (Cont. Margin)	89.57		83.20		48.32		28.29	
Return to Equity	40.06	6.53%	31.21	4.99%	-4.52	-0.68%	-19.21	-4.11%
Equity	86%		87%		93%		86%	
Debt Capacity ($/Ac)	586.12		540.04		300.60		169.06	
Productive Value of Land ($/Ac)	526.99		461.09		124.49		-2.42	
Market Value of Land ($/Ac)	673.53		654.55		690.96		663.95	
Machinery Investment ($/Ac)	215.89		217.30		243.02		190.53	

Due to the variation in the value of production returns to capital were quite varied, ranging from $48.32 per acre for barley to $89.57 per acre for wheat. The only crops generating a positive return to equity were wheat ($40.06 per acre) and canola ($31.21 per acre). Barley production with a lower value of production failed to cover all costs resulting in a negative return to equity of $4.52 per acre.

Debt carrying capacity was variable and ranged from $300.60 per acre for barley production to $586.12 per acre for wheat production. Land productive values also varied from $124.49 per acre for barley to $526.99 per acre for wheat production. Machinery investment on a per acre basis was the lowest for wheat production at $215.89, while canola and barley had an investment of $217.30 and $243.02, respectively.

Barrhead Region

Table 11 presents costs and returns for the main crops surveyed in the Barrhead region. Barley was found to be the most important crop grown by the participating farms as 31 enterprises averaging 284.81 acres were analyzed for the 20 farms studied.

Yields in the Barrhead region in 1983 were quite variable as canola had the lowest yield relative to the other regions at 12.98 bushels per acre while wheat had the highest yield of 38.83 bushels per acre. The barley yield at 46.27 bushels per acre was about average relative to the Vermilion and Peace River regions. The value of production ranged from $118.69 per acre for barley to $169.96 per acre for wheat.

Variable costs ranged from $74.81 per acre for barley production to $81.16 per acre for canola production. Higher costs for crop insurance and custom work were of significance in canola production. As was observed material cost namely, fertilizer, chemical, and seed costs comprised 50 per cent of the variable costs incurred in wheat and barley production. Capital cost was approximately the same ranging from $50.20 per acre for barley production to $54.23 per acre for canola production. This cost when expressed on a per bushel basis was quite significant. Canola growers reported the highest equity of 94 per cent followed by barley growers at 87 per cent and finally the wheat group at 85 per cent and explains why the paid capital interest cost was so

TABLE 11: COMPARISON OF CROP ALTERNATIVES FOR THE BARRHEAD REGION - 1983

CROP	WHEAT		CANOLA		BARLEY	
Number of Enterprise	18		17		31	
Average Acreage	192.11		154.12		284.81	
Average Yield (Bu/Acre)	38.83		12.98		46.27	
	- - - - - - - - - Dollars Per Acre - - - - - - - - - -					
Crop Sales	163.18		105.78		109.20	
Insurance Receipts	6.78		29.23		9.50	
Value of Production	169.96	4.38/Bu	135.01	10.40/Bu	118.69	2.57/Bu
VARIABLE COST						
Materials	38.40		36.02		37.41	
Hail/Crop Insurance	2.02		4.73		2.04	
Fuel and Repairs	17.41		17.32		18.12	
Paid Labour	1.67		2.73		2.23	
Operator Labour	12.87		12.70		11.91	
Miscellaneous	3.97		7.66		3.10	
TOTAL VARIABLE COST	76.34	1.97/Bu	81.16	6.25/Bu	74.81	1.62/Bu
CAPITAL COST						
Cash Rent/Crop Share	16.69		18.73		12.42	
Taxes and Insurance	2.05		2.90		2.84	
Equip.,Bldg. Depreciation	25.02		27.69		27.03	
Paid Capital Interest	9.49		4.92		7.90	
TOTAL CAPITAL COST	53.25	1.37/Bu	54.23	4.18/Bu	50.20	1.08/Bu
TOTAL COST	129.59	3.34/Bu	135.39	10.43/Bu	125.01	2.70/Bu
Return to Capital (Cont. Margin)	93.62		53.85		43.88	
Return to Equity	40.36	7.76%	-0.38	-0.06%	-6.31	-1.00
Equity	85%		94%		89%	
Debt Capacity ($/Ac)	623.63		347.00		279.52	
Productive Value of Land ($/Ac)	565.66		169.92		95.73	
Market Value of Land ($/Ac)	756.96		792.06		704.44	
Machinery Investment ($/Ac)	220.64		239.41		234.14	

much lower for canola production at $4.92 per acre versus that of $7.90 and $9.49 per acre for barley and wheat, respectively.

Total production cost for grain production in the Barrhead region ranged from $125.01 per acre for barley to $135.39 for canola. Relating these costs to the value of production, it was found that returns from barley and canola production were both insufficient to cover all production costs. The only crop with a value of production greater than its cost was wheat which netted a return to equity of $40.36 per acre.

The debt carrying capacity ranged from $279.52 per acre for barley production to $623.63 per acre for wheat production. Productive value of land was also low for barley production at $95.73 per acre while for wheat production this value was $565.66 per acre. As indicated in Table 11, the market value of land as reported by the study participants ranged from $704.44 per acre for barley production to $792.06 per acre for canola production. Machinery investment on a per acre basis was the highest at $220.64 for wheat production while for canola and barley production this amount was $239.41 and $234.14 per acre, respectively.

Peace River Region

Canola and wheat production as indicated in Table 12 in the Peace River region were equally important crops in 1983 as 15 canola enterprises averaging 182.44 acres and 12 wheat enterprises averaging 214.40 acres were analyzed for the 11 farms on study. Yield for the three main crops averaged 13.62 bushels for canola, 29.90 bushels for wheat, and 49.67 bushels for barley. Value of production was the highest for wheat at $149.03 per acre followed by barley at $125.50 per acre and finally, by canola at $119.46 per acre. Overall, on a per acre basis the Peace River farms had a lower return and cost structure in relation to farms surveyed in the Vermilion, Red Deer and Barrhead regions.

Variable costs were the highest for wheat production at $77.11 per acre, followed by canola at $69.69 per acre and then by barley at $62.80 per acre. Barley production showed consistently lower costs for material input, fuel and repairs, labour, and miscellaneous items. Capital costs among the three crops were also quite varied ranging from $43.17 per acre for wheat production to $53.05 per acre for canola production. This high capital cost for canola

TABLE 12: COMPARISON OF CROP ALTERNATIVES FOR THE PEACE RIVER REGION - 1983

CROP	WHEAT		CANOLA		BARLEY	
Number of Enterprises	12		15		8	
Average Acreage	214.40		182.44		192.00	
Average Yield (Bu/Acre)	29.90		13.62		49.67	
	- - - - - - Dollars Per Acre - - - - - - - -					
Crop Sales	131.55		108.99		124.17	
Insurance Receipts	17.49		10.47		1.34	
Value of Production	149.03	4.98/Bu	119.46	8.77/Bu	125.50	2.53/Bu
VARIABLE COST						
Materials	32.26		25.97		25.49	
Hail/Crop Insurance	2.55		3.93		2.60	
Fuel and Repairs	19.33		16.99		14.94	
Paid Labour	3.35		4.16		2.95	
Operator Labour	11.55		10.37		10.25	
Miscellaneous	8.07		8.27		6.57	
TOTAL VARIABLE COST	77.11	2.58/Bu	69.69	5.12/Bu	62.80	1.26/Bu
CAPITAL COST						
Cash Rent/Crop Share	2.94		7.69		4.83	
Taxes and Insurance	3.16		2.95		3.18	
Equip.,Bldg. Depreciation	23.06		26.66		20.45	
Paid Capital Interest	14.02		15.74		15.25	
TOTAL CAPITAL COST	43.17		53.05	3.90/Bu	43.72	0.88/Bu
TOTAL COST	120.28	4.02/Bu	122.75	9.01/Bu	106.52	2.14/Bu
Return to Capital (Cont. Margin)	71.92		49.76		62.71	
Return to Equity	28.75	6.27%	-3.29	-0.83%	18.99	5.08%
Equity	80%		75%		73%	
Debt Capacity ($/Ac)	468.34		318.81		405.40	
Productive Value of Land ($/Ac)	343.81		77.79		284.88	
Market Value of Land ($/Ac)	377.99		361.94		370.68	
Machinery Investment ($/Ac)	198.94		236.91		185.69	

production is attributable to the high costs observed for cash rent/crop share, depreciation, and paid capital interest when compared to wheat and barley.

Total production cost amounted to $106.52 per acre for barley and $122.75 per acre for canola. For wheat this amount was $120.28 per acre. Generally, in determining the profitability of a crop its prospective value of production must be weighed against its cost. Despite the high cost structure observed for wheat it had the highest return to equity at $28.75 per acre or 6.27 per cent. This was followed by barley which had a return to equity of $18.99 per acre or 5.08 per cent. Canola failed to generate a positive return to equity in 1983. Equity levels on farms in the Peace River region ranged from 73 to 80 per cent while the farms in the Red Deer, Vermilion and Barrhead regions reported levels of 85 to 95 per cent.

The debt carrying capacity ranged from $318.81 per acre for canola production to $468.34 per acre for wheat production. Productive values for land were relatively lower ranging from $77.79 per acre for canola to $343.81 per acre for wheat. As the study shows, the productive and market values for land were most similar in the Peace River region relative to the other three regions studied. As to machinery investment, this was the lowest for barley production at $185.69 per acre. For canola and wheat production, machinery investment per acre were $236.91 and $198.94, respectively.

SECTION V

A COMPARISON OF COSTS AND RETURNS FOR GRAIN PRODUCTION BY SOIL TYPE

It is generally recognized that costs and returns vary among farms because of differences in weather, input use, management techniques, and soil type. With 69 grain farms on study in 1983, an attempt was made to observe the performance of the total farm and also the average yield, value of production and expenditures for each crop on different types of soil.

Black Soil - Total Farm

Presented in Table 13 are the costs and returns for the average farm with a black soil type in each of the study areas. A total of 44 farms or 64 per cent of the farms surveyed in 1983 reported farming on black soil. The cultivated acreage on these farms ranged from 743.50 acres in the Red Deer region to 1385.29 acres in the Vermilion region. The farms in the Red Deer region with black soil reported the highest value of production at $167.36 per acre. Their variable and capital cost structure was also relatively high but due to the high associated return was more than offset thereby yielding a return to equity of $20.55 per acre. Farms in the Vermilion region were second as their return to equity was $14.40 per acre. For the Barrhead and Peace River regions their return to equity was $1.98 per acre and $8.41 per acre, respectively. Debt capacity on farms with black soil ranged from $253.95 per acre in the Peace River region to $490.36 per acre in the Red Deer region. The range in the productive value of land was much narrower ranging from $114.08 per acre in the Peace River region to $329.94 per acre in the Red Deer region.

Generally, as indicated in Table 13, the returns, costs and net returns tend to increase going south from Peace River to Red Deer and the market value of land also increases from $403.36 per acre in the Peace River region to $902.50 per acre in the Red Deer region. Investment in machinery also shows a similar trend, as the Peace River region reported an average of $158.50 per acre versus that of $271.52 per acre for the Red Deer region.

Brown Soil - Total Farm

The information gathered on farms with brown soil is summarized in Table 14. Only 16 of the 69 farms on study had brown soil thereby limiting the conclusions that can be drawn from this analysis. The 13 farms in the Red Deer region along with the 3 farms in the Vermilion region with brown soil reported lower value of productions relative to the black soil. Of significance was the higher return to equity observed for the Vermilion region on Brown soil and is due to the lower investment (land and machinery) and variable costs associated with such farms. Return to equity for the brown soil farms were $14.07 per acre (2.80 per cent) in the Red Deer region and $40.88 per acre (6.35 per cent) in the Vermilion region. The land values and machinery investment for the brown soil farms are also shown as well in Table 13.

Grey-Wooded Soil - Total Farm

Table 15 presents costs and returns data for the 9 farms surveyed in the Barrhead and Peace River regions with grey-wooded soil. Since the information presented for the Barrhead region is fairly limited, reference will only be made to the farms with grey-wooded soil in the Peace River region in relation to the farms with black soil.

Comparing farms with black soil type to grey-wooded soil type in the Peace River region shows the value of production to be 6.5 per cent higher at $108.70 per acre for the latter. Although the grey-wooded soil group had lower variable costs relative to the black soil group, these farms had a higher total production cost due to the higher interest cost associated with capital purchases. The return to equity for the grey-wooded soil group was $9.99 per acre (2.72 per cent) and compares with $8.41 per acre (1.75 per cent) for the black soil group. The equity level for the brown soil group was 73 per cent versus 89 per cent for the black soil group. The productive value of the grey-wooded soil and machinery investment were relatively higher at $202.71 and $185.29 per acre, respectively.

TABLE 13: REGIONAL COMPARISON OF COSTS AND RETURNS ON GRAIN FARMS WITH BLACK SOIL - 1983

REGION	RED DEER		VERMILION		BARRHEAD		PEACE RIVER	
Number of Farms	8		14		17		5	
Average Acreage	743.50		1385.29		1016.00		919.20	
	- - - - - - - - - - - Dollars Per Acre - - - - - - - - - - -							
Crop Sales	162.79		128.46		108.82		88.74	
Insurance Receipts	4.56		9.84		10.72		13.36	
Value of Production	167.36		138.40		119.54		102.10	
VARIABLE COST								
Materials	42.01		31.87		33.13		25.97	
Hail/Crop Insurance	9.89		2.04		2.26		2.47	
Fuel and Repairs	16.36		14.80		16.24		13.41	
Paid Labour	3.46		3.12		2.04		3.29	
Operator Labour	13.38		14.87		11.60		10.48	
Miscellaneous	5.78		6.33		4.29		5.98	
TOTAL VARIABLE COST	90.88		73.03		69.56		61.60	
CAPITAL COST								
Cash Rent/Crop Share	11.20		12.19		12.94		3.70	
Taxes and Insurance	4.49		3.93		2.53		3.21	
Equip.,Bldg. Depreciation	31.03		24.62		25.02		18.19	
Paid Capital Interest	9.22		10.23		7.52		6.99	
TOTAL CAPITAL COST	55.93		50.96		48.01		32.09	
TOTAL COST	146.81		124.00		117.57		93.69	
Return to Capital (Cont. Margin)	76.48		65.36		49.99		40.50	
Return to Equity	20.55	2.13%	14.40	2.34%	1.98	0.34%	8.41	1.75%
Equity	92%		87%		89%		89%	
Debt Capacity ($/Ac)	490.36		418.43		323.22		253.95	
Productive Value of Land ($/Ac)	329.94		297.47		171.12		114.08	
Market Value of Land ($/Ac)	902.50		659.03		750.49		403.36	
Machinery Investment ($/Ac)	271.52		220.40		218.93		158.50	

TABLE 14: REGIONAL COMPARISON OF COSTS AND RETURNS ON GRAIN FARMS WITH BROWN SOIL - 1983

REGION	RED DEER		VERMILION	
Number of Farms	13		3	
Average Acreage	1620.23		1256.00	
	- - - Dollars Per Acre - - -			
Crop Sales	124.36		131.76	
Insurance Receipts	3.00		0	
Value of Production	127.36		131.76	
VARIABLE COST				
Materials	28.20		22.12	
Hail/Crop Insurance	2.81		2.70	
Fuel and Repairs	11.94		13.62	
Paid Labour	4.92		0.15	
Operator Labour	9.98		17.10	
Miscellaneous	9.56		4.44	
TOTAL VARIABLE COST	67.41		60.13	
CAPITAL COST				
Cash Rent/Crop Share	13.88		5.69	
Taxes and Insurance	2.62		2.08	
Equip.,Bldg. Depreciation	19.79		16.19	
Paid Capital Interest	9.59		6.79	
TOTAL CAPITAL COST	45.88		30.75	
TOTAL COST	113.30		90.88	
Return to Capital (Cont. Margin)	59.95		71.63	
Return to Equity	14.07	2.80%	40.88	6.35%
Equity	83%		89%	
Debt Capacity ($/Ac)	390.50		473.73	
Productive Value of Land ($/Ac)	301.92		484.36	
Market Value of Land ($/Ac)	626.10		686.73	
Machinery Investment ($/Ac)	170.70		142.00	

TABLE 15: REGIONAL COMPARISON OF COSTS AND RETURNS ON GRAIN FARMS WITH GREY-WOODED SOIL - 1983

REGION	BARRHEAD		PEACE RIVER	
Number of Farms	3		6	
Average Acreage	896.67		1152.00	
	- - - Dollars Per Acre - - -			
Crop Sales	139.68		104.11	
Insurance Receipts	0		4.59	
Value of Production	139.68		108.70	
VARIABLE COST				
Materials	26.71		19.29	
Hail/Crop Insurance	4.53		2.25	
Fuel and Repairs	16.82		16.60	
Paid Labour	0.65		2.29	
Operator Labour	13.61		8.95	
Miscellaneous	8.20		6.23	
TOTAL VARIABLE COST	70.52		55.61	
CAPITAL COST				
Cash Rent/Crop Share	15.54		4.50	
Taxes and Insurance	3.96		2.69	
Equip.,Bldg. Depreciation	32.31		20.57	
Paid Capital Interest	16.01		15.35	
TOTAL CAPITAL COST	67.82		43.10	
TOTAL COST	138.34		98.71	
Return to Capital (Cont. Margin)	69.16		53.09	
Return to Equity	1.34	0.28%	9.99	2.72%
Equity	74%		73%	
Debt Capacity ($/Ac)	444.07		343.28	
Productive Value of Land ($/Ac)	188.79		202.71	
Market Value of Land ($/Ac)	388.48		337.50	
Machinery Investment ($/Ac)	277.88		185.29	

Barley Production By Soil Type

To illustrate the difference in yields, expenditures, and overall performance of a specific crop on different soils, two comparisons are provided for which sufficient data was available. Table 16 provides a comparison of barley grown on black and brown soil in the Red Deer region while Table 17 compares wheat production in the Peace River region on black and grey-wooded soils.

With reference to Table 16, barley production on black soil outyielded barley on brown soil by 15.72 bushels per acre. However, the value of production for barley grown on black soil was only $13.80 per acre higher than the barley grown on brown soil and is primarily due to the higher crop insurance receipts for the brown soil group.

As indicated in the table, the cost of production for the black soil group was significantly higher relative to the brown soil group. To illustrate, the variable cost for barley grown on black soil amounted to $101.83 per acre where as it was $79.21 per acre on the brown soil. Cost items such as material input, crop insurance, fuel and repairs were all higher for the barley grown on black soil. As well, barley grown on black soil had significantly higher capital costs for items such as cash rent/crop share and depreciation. The per acre capital cost for barley grown on black soil was $57.18 versus $47.38 for barley grown on brown soil. Total production cost amounted to $159.01 per acre for barley grown on black soil and $126.59 per acre for barley grown on brown soil.

Although yield, hence consequent return was lower for barley grown on brown soil, the contribution margin and return to equity were higher relative to the barley grown on black soil. The return to equity for barley grown on brown soil was $27.78 per acre (3.65 per cent) as compared to $9.16 per acre (0.96 per cent) for barley grown on black soil. Higher production costs associated with barley on black soil are related to the higher valued land and also the higher machinery investment that was observed.

The farms growing barley on black soil had a higher equity level in their capital assets at 94 per cent compared to 81 per cent for the farms growing barley on brown soil. Due the higher net returns for barley on brown soil, debt capacity and productive land value were higher at $485.81 and $380.26 per acre, respectively. This compares to a debt capacity of $421.25 per acre and a productive land value of $219.73 for barley grown on black soil. As this

TABLE 16: COMPARISON OF COSTS AND RETURNS FOR BARLEY PRODUCTION IN THE RED DEER REGION BY SOIL TYPE - 1983

	BLACK SOIL		BROWN SOIL	
Number of Enterprise	10		6	
Average Acreage	176.5		140.0	
Average Yield (Bu/Ac)	67.20		51.48	
	- - Dollars Per Acre - -			
Crop Sales	168.17		149.60	
Insurance Receipts	0		4.77	
Value of Production	168.17		154.37	
VARIABLE COST				
Materials	41.89		31.38	
Hail/Crop Insurance	9.94		3.35	
Fuel and Repairs	19.14		13.20	
Paid Labour	4.03		7.71	
Operator Labour	19.67		8.52	
Miscellaneous	7.16		15.05	
TOTAL VARIABLE COST	101.83		79.21	
CAPITAL COST				
Cash Rent/Crop Share	13.84		2.98	
Taxes and Insurance	4.49		3.84	
Equip.,Bldg. Depreciation	32.91		24.56	
Paid Capital Interest	5.93		16.00	
TOTAL CAPITAL COST	57.18		47.38	
TOTAL COST	159.01		126.59	
Return to Capital (Cont. Margin)	66.34		75.16	
Return to Equity	9.16	0.96%	27.78	3.65%
Equity	94%		81%	
Debt Capacity ($/Ac)	421.25		485.81	
Productive Value of Land ($/Ac)	219.73		380.26	
Market Value of Land ($/Ac)	894.38		702.68	
Machinery Investment ($/Ac)	282.38		201.31	

analysis reveals, high returns to equity are not always associated with high yields. In fact, the farm having the lowest cost per bushel produced regardless of the magnitude of yield would experience the highest net returns.

Wheat Production By Soil Type

Table 17 provides a costs and returns comparison for wheat grown on black and grey-wooded soil in the Peace River region. Wheat yield was higher on the grey-wooded soil by more than 8 bushels per acre. The difference in value of production was not as great due to the higher crop insurance receipts on the farms with black soil.

A higher cost structure was associated with wheat grown on black soil. Variable costs were $82.66 per acre as compared to $71.72 per acre for wheat grown on grey-wooded soil. Higher costs for material, crop insurance and labour accounted for this difference. However, it was found that the capital cost was higher on the grey-wooded soil mainly due to the lower equity position (72 per cent) on these farms relative to those farms on black soil (88 per cent). This is also demonstrated by the amount of paid capital interest on farms with grey-wooded soil at $20.06 per acre as compared to $7.80 per acre for farms with black soil. In terms of total production these costs were higher for wheat grown on black soil at $122.64 per acre as compared to $117.99 per acre for wheat grown on grey-wooded soil.

As can be seen, the lower valued grey-wooded soil in the Peace River region not only outyielded the black soil in terms of wheat yields but also had a lower cost structure. Consequently, the return to capital (contribution margin) was much higher at $82.34 per acre for wheat grown on grey-wooded soil compared to $61.20 for wheat grown on black soil. Similarly, the return to equity was higher for wheat grown on grey-wooded soil at $36.08 per acre (8.26 per cent) in comparison to $21.22 per acre (4.41 per cent) for wheat grown on black soil.

TABLE 17: REGIONAL COMPARISON OF COSTS AND RETURNS FOR WHEAT PRODUCTION IN THE PEACE RIVER REGION BY SOIL TYPE - 1983

	BLACK SOIL	GREY-WOODED SOIL
Number of Enterprise	6	6
Average Acreage	169.1	290.0
Average Yield (Bu/Ac)	25.81	33.87
	- - Dollars Per Acre - -	
Crop Sales	113.57	149.02
Crop Insurance Receipt	30.28	5.05
Value of Production	143.86	154.06
VARIABLE COST		
Materials	35.59	29.02
Hail/Crop Insurance	2.99	2.11
Fuel and Repairs	17.39	21.21
Paid Labour	4.81	1.94
Operator Labour	12.52	10.61
Miscellaneous	9.36	6.83
TOTAL VARIABLE COST	82.66	71.72
CAPITAL COST		
Cash Rent/Crop Share	5.96	-
Taxes and Insurance	2.95	3.37
Equip.,Bldg. Depreciation	23.28	22.84
Paid Capital Interest	7.80	20.06
TOTAL CAPITAL COST	39.99	46.26
TOTAL COST	122.64	117.99
Return to Capital (Cont. Margin)	61.20	82.34
Return to Equity	21.22 4.41%	36.08 8.26%
Equity	88%	72%
Debt Capacity ($/Ac)	396.77	537.90
Productive Value of Land ($/Ac)	248.38	436.56
Market Value of Land ($/Ac)	407.75	349.08
Machinery Investment ($/Ac)	196.98	200.85

Wheat grown on grey-wooded soil was unique in that the productive value of land at $436.56 per acre exceeded its reported market value of $349.08 per acre. The opposite was observed for wheat grown on black soil as its productive value at $248.38 per acre was less than its market value of $407.75 per acre. Machinery investment on a per acre basis was not much different for the two soil types averaging $196.98 for the black soil and $200.85 for the grey-wooded soil.

SECTION VI

A COST COMPARISON OF CROP PRODUCTION BY LAND TENURE

With the cost of farm machinery escalating many farmers have turned to renting land either to justify the purchase of farm equipment or to increase their overall farm income. Secondly, with land being considered the most expensive capital resource many farmers have channeled their limited money supply into the purchase of farm equipment thereby increasing the need to cash rent or crop share. As is always the case a relatively high cost structure is usually associated with newly purchased land expecially if the equity level is low. In such cases, the interest paid per purchased acre will exceed the cash rent/crop share cost of rented land. This section is intended to observe the actual cost difference in the production of grain/oilseeds on owned land versus rented land. Tables 18, 19 and 20 provide cost comparisons for grain production by land tenure for the Red Deer, Vermilion, and Barrhead regions.

Assuming similar yields for both types of land tenure, per acre variable costs are not expected to differ. However, the actual capital cost structure is quite substantial for rented land as the cash rent/crop share cost per acre is greater than the paid capital interest reported by farmers owning land. With reference to Table 18, the capital cost for wheat production on owned land in the Red Deer Region was $42.51 per acre while it was $59.05 per acre for wheat grown on rented land. For canola the capital cost on owned land and rented land was $39.06 and $81.74 per acre, respectively.

As observed, farms with rented land had lower equity levels and paid capital interest cost. Indicated in Table 18 are the per acre equity values (based on current market values) that are used in calculating the percentage return to equity. For wheat grown on owned land, its return to equity was $26.21 per acre or 3.42 per cent, while its total equity per acre was $766.37. On rented land wheat had a return to equity of $25.21 per acre or 16.49 per cent, and a total equity per acre of $152.88. A significantly lower machinery investment was reported for the rented enterprise.

Table 19 summarizes the costs and returns for wheat, canola, and barley production by land tenure in the Vermilion region. As can be seen, there was no significant difference in the value of production among the three crops.

Variable cost was slightly lower on rented land due to lower material, fuel and repair costs. As to the capital cost, the cash rent/crop share cost on the rented enterprises ranged from $35.88 per acre for wheat to $43.32 per acre for barley. Also, due to the lower machinery investment reported for the rented enterprises, a lower depreciation cost was also observed. The paid capital interest per acre for the rented enterprises was up to a third of that reported for the owned enterprises.

A summary of costs and returns for wheat, canola, and barley production by land tenure for the Barrhead region is presented in Table 20. Although yield and value of production did vary by land tenure, no firm conclusions can be drawn with respect to the return side. As to the cost side, variable costs were observed to be only slightly lower on rented land versus the owned land. Fuel and repair costs were reported to be higher for rented enterprises. Observing the capital cost structure, cash rent/crop share ranged from $23.97 per acre for barley to $27.75 per acre for wheat. The rented enterprises with a significantly lower depreciation and capital investment had higher total production costs associated with grain production. Like the other regions machinery investment per acre was much lower on rented land as opposed to owned land.

TABLE 18: SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1983 RED DEER REGION

	WHEAT				CANOLA			
	OWNED		RENTED		OWNED		RENTED	
Number of Farms	17		12		10		8	
Average Acreage	403.8		375.8		217.2		236.2	
Yield (Bu/Acre)	31.49		33.16		26.51		23.15	
	- - - - - - - - - - Dollars Per Acre - - - - - - - - -							
Crop Sales	142.42		155.37		212.10		185.23	
Insurance Receipts	5.75		0		7.73		.42	
VALUE OF PRODUCTION	148.18		155.37		219.83		185.65	
VARIABLE COST								
Materials	33.76		33.51		36.89		42.50	
Fuel/Repairs	13.99		11.30		14.74		12.45	
Operator Labour	12.42		8.03		14.40		9.47	
Miscellaneous	19.28		18.28		21.00		24.62	
TOTAL VARIABLE COST	79.45		71.12		87.03		89.04	
CAPITAL COST								
Cash Rent/Crop Share	-		34.97		-		54.32	
Taxes and Insurance	4.13		0.92		3.88		0.80	
Bldg. Equip. Deprec.	24.85		17.86		25.09		20.13	
Paid Capital Interest	13.54		5.29		10.09		6.49	
TOTAL CAPITAL COST	42.51		59.05		39.06		81.74	
TOTAL COST	121.96		130.16		126.09		170.78	
Return to Capital	68.73		84.25		132.80		96.61	
Return to Equity	26.21	(3.42%)	25.21	(16.49%)	93.74	(11.13%)	14.87	(8.25%)
Equity	$766.37	(84%)	$152.88	(77%)	$842.23	(88%)	$180.24	(75%)
Machinery Investment	208.76		157.57		213.39		174.96	

TABLE 19: SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1983 VERMILION REGION

	WHEAT		CANOLA		BARLEY	
	OWNED	RENTED	OWNED	RENTED	OWNED	RENTED
Number of Farms	17	13	17	6	10	7
Average Acreage	287.6	206.1	218.7	252.1	272.7	164.0
Yield (Bu/Acre)	35.74	35.35	18.42	17.08	40.87	50.23
	- - - - - - - - - - - - - - - - - - Dollars Per Acre - - - - - - - - - - - - - - - - - -					
Crop Sales	159.68	156.33	145.56	133.59	100.53	124.63
Insurance Receipts	4.85	5.20	13.95	21.96	22.01	2.09
VALUE OF PRODUCTION	164.53	161.53	159.51	155.55	122.54	126.71
VARIABLE COST						
Materials	36.86	34.04	37.33	32.00	35.00	30.41
Fuel/Repairs	15.79	13.38	17.54	11.50	15.78	14.98
Operator Labour	16.23	13.20	16.13	11.79	17.87	15.64
Miscellaneous	11.70	11.70	12.18	12.72	12.04	17.25
TOTAL VARIABLE COST	80.58	72.32	83.18	68.01	80.69	78.28
CAPITAL COST						
Cash Rent/Crop Share	-	35.88	-	40.58	-	43.32
Taxes and Insurance	5.33	1.12	5.27	1.63	5.40	2.82
Bldg. Equip. Depreciation	27.38	21.47	26.15	22.79	29.66	25.82
Paid Capital Interest	14.92	3.99	15.32	4.66	9.63	4.65
TOTAL CAPITAL COST	47.62	62.46	46.73	69.66	44.69	76.61
TOTAL COST	128.21	134.77	129.91	137.67	125.38	154.89
Return to Capital	83.94	89.21	76.34	87.54	41.85	48.43
Return to Equity	36.32 (4.52%)	26.75 (13.02%)	29.60 (3.57%)	17.88 (8.37%)	-2.84	-28.17
Equity	$803.54 (85%)	205.45 (87%)	$829.13 (86%)	$224.25 (86%)	$956.67 (92%)	$243.69 (87%)
Machinery Investment	245.03	193.45	230.55	206.20	258.99	236.10

TABLE 20: SUMMARY OF COSTS AND RETURNS FOR CROPS BY LAND TENURE - 1983 BARRHEAD REGION

	WHEAT		CANOLA		BARLEY	
	OWNED	RENTED	OWNED	RENTED	OWNED	RENTED
Number of Farms	11	7	6	11	15	16
Average Acreage	121.3	313.57	116.7	174.6	283.60	285.9
Yield (Bu/Acre)	40.79	37.53	112.17	143.33	131.12	107.14
	- - - - - - - - - - - - - - - - - - Dollars Per Acre - - - - - - - - - - - - - - - - - -					
Crop Sales	172.68	156.88	80.12	143.33	111.41	107.14
Insurance Receipts	17.01	0	32.05	0	19.71	0
VALUE OF PRODUCTION	189.68	156.88	112.17	143.33	131.12	107.14
VARIABLE COST						
Materials	41.16	35.56	33.21	37.02	38.29	36.58
Fuel/Repairs	16.47	18.02	15.42	18.00	16.49	17.99
Operator Labour	13.27	12.60	14.25	12.14	13.16	10.75
Miscellaneous	6.65	8.35	20.52	13.18	7.03	9.35
TOTAL VARIABLE COST	77.55	75.53	83.40	80.34	74.97	74.67
CAPITAL COST						
Cash Rent/Crop Share	-	27.75	-	25.55	-	23.97
Taxes and Insurance	4.19	0.64	4.60	2.28	4.40	1.39
Bldg. Equip. Depreciation	28.26	22.88	30.39	26.70	29.69	24.55
Paid Capital Interest	16.82	4.63	8.44	3.63	11.82	4.26
TOTAL CAPITAL COST	49.27	55.89	43.43	58.16	45.92	54.17
TOTAL COST	126.82	131.43	126.83	138.51	120.89	128.84
Return to Capital	112.13	81.34	28.77	62.99	56.15	32.47
Return to Equity	62.86 (6.44%)	25.45 (11.69%)	-14.66	4.83 (0.99%)	10.23 (0.97%)	-21.70
Equity ($/Acre)	976.09 (85%)	217.71 (85%)	1025.17 (93%)	487.77 (94%)	1054.64 (90%)	241.65 (87%)
Machinery Investment	248.59	202.12	254.22	234.02	255.62	214.18